Three new species of Neogene *Truncatella* Risso, 1840 (Gastropoda: Truncatellidae) from Florida, USA

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ABSTRACT

Three new species of truncatellid gastropods are described and illustrated. Two species are from the lower Miocene Chipola Formation of Calhoun County, Florida, and one is from upper Pliocene to lower Pleistocene deposits of the upper? Pinecrest beds, Tamiami Formation of Sarasota County, Florida. All three new species are believed to have inhabited shallow water, marine environments.

INTRODUCTION

Gastropods of the family Truncatellidae display the ability to traverse vast distances of ocean to populate tropical and warm temperate environments. This ability to inhabit distant shorelines is accomplished by attaching themselves or egg capsules to various pieces of flotsam and riding ocean currents. Once established on a new shoreline, most truncatellids live at the high tide line, where they reside under protective material such as seaweeds, rocks, and boards. The distribution of truncatellid species within any particular region has been found to be irregular and appears to be due to how groups of individuals are transported ashore by flotsam (Clench and Turner, 1948). Life history information regarding amphibious forms shows that they lay their egg eapsules on supratidal detritus, are capable of digesting cellulose, and possess the ability to estivate for several months while away from water (Rosenberg, 1996). Populations of truncatellids have colonized terrestrial habitats where they survive under leaf litter at elevations as high as 600 meters (Rosenberg, 1996). Today, in Florida and the Gulf Coast region of the USA, only three species are known: *Truncatella caribaeensis* Reeve, 1842, *Truncatella clathrus* Lowe, 1832, and *Truncatella pulchella* Pfeiffer, 1839. Herein, we deseribe three new species of *Truncatella* from the Neogene of Florida. Studies of the collecting sites (Vokes, 1989) where the new fossil species were discovered indieate that they were shallow water, marine environments.

MATERIALS AND METHODS

Specimens of *Truncatella* species from the lower Miocene Chipola Formation were collected from two localities in the Florida Museum of Natural History, Invertebrate Paleontology Division (FLMNH IP) Directory along the Chipola River in Calhoun County, Florida (Figure 1). One specimen was removed from matrix at FLMNH IP CA004, and two were collected from submerged deposits at FLMNH IP CA018. All sampled sediments were *in situ*. Furthermore, from the latter site, pieces of loosely consolidated fossiliferous sandstone were removed from underwater ledges with the aid of SCUBA. After removal, the material was brought to the FLMNH IP laboratory for serial screen washing, air dried, and then sediments were picked under stereomicroscope. From FLMNH IP CA018, one specimen (UF 71914) came from the lowest ledge near the bottom of the river, and one specimen (UF 71913) was from the uppermost underwater ledge. The 18 Tamiami Formation (upper? Pinecrest beds) specimens (UF 71915 –71917, UF 81225, and UF 261371) were all sieved from spoil (float) at FLMNH IP locality SO001 in Sarasota County, Florida. The material is most likely from the upper Pinecrest beds of early Pleistocene age. This assessment is based on a current, highly detailed examination of the *in situ* lower Pinecrest beds fauna which shows no presence of truncatellids (Lee et al., in preparation).

Specimens in Figures 2–7 were mounted to SEM stubs, sputter coated with gold-palladium, and imaged using a Hitachi field emission scanning electron microscope and later re-imaged using a Zeiss EVO MA 10 scanning electron microscope. In both instances, linear dimensions were determined by the SEM's hardware and software, respectively. All SEM images were then processed in Photoshop 6 for the plate layout. Fossil specimens were compared to the three recent species

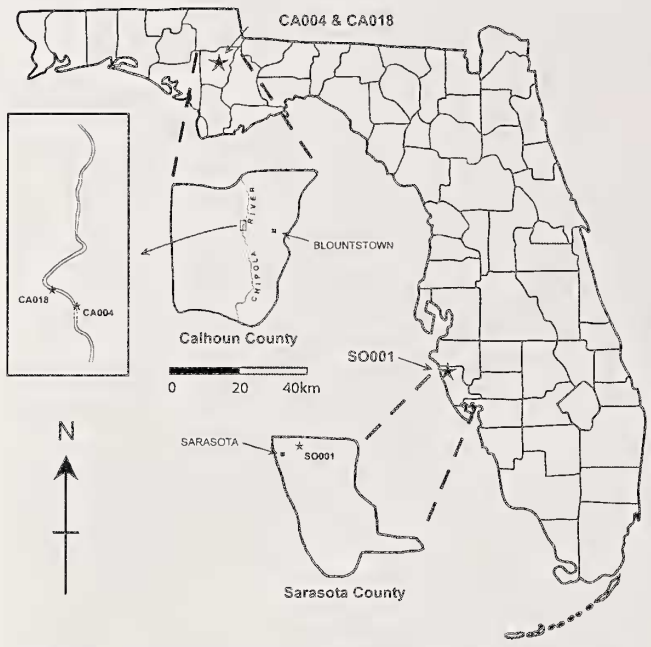


Figure 1. Map showing collecting localities of the three new Neogene species of *Truncatella*.

(listed above) borrowed from the FLMNH Invertebrate Zoology Division.

SYSTEMATICS

Superfamily Rissooidea Gray, 1847
Family Truncatellidae Gray, 1840

Genus *Truncatella* Risso, 1826

Type Species: *Truncatella laevigata* Risso, subsequent designation, Gude, 1921 (= *Helix subcylindrica* Linné, 1767: 1248).

Truncatella chipolana new species
(Figures 2–3)

Description: Shell minute, elongate-cylindrical with 4 moderate to highly convex whorls. Suture strongly impressed, whorls of nearly equal size giving shell a somewhat straight-sided appearance. Whorls with well-developed, rounded, evenly spaced, opisthocline ribs that extend to sutures (21 on body whorl of holotype and 26 on body whorl of paratype). Shell imperforate, aperture holostomatous and ovate, surrounding lip thickened, inner lip not adnate with parietal area.

Type Material: Holotype: UF 71914, maximum height 4.62 mm, from type locality; Paratype: UF 122257 from FLMNH IP locality CA004, Chipola Formation, USA, Florida, Calhoun County, east bank of Chipola River (30.451388, –85.160166, datum WGS84).

Type Locality: FLMNH IP locality CA018, Chipola Formation, USA, Florida, Calhoun County, west bank of Chipola River (30.4535, –85.163722, datum WGS84).

Distribution: *Truncatella chipolana* is an extremely rare species that has been collected from only two localities. The holotype comes from very rich (in abundance and diversity) deposits along the Chipola River that have yielded the remains of both marine and terrestrial gastropods. At the Type section, the holotype was derived from the lower bed.

Etymology: Named for the Chipola River, where the specimens were excavated and collected.

Remarks: *Truncatella chipolana* is similar to *T. pulchella*. Like *T. chipolana*, *T. pulchella* has an elongate form, possesses about 20–26 opisthocline ribs on the body whorl, and has an inner lip that is not attached to the parietal area. However, the two differ in that the *T. pulchella* has more tapering whorls (not as straight-sided), axial ribs less opisthocline and ribs much sharper (although degree of sharpness may be a function of abrasion on the fossil specimens), a narrower peristome, and more oval aperture.

Truncatella andymurrayi new species
(Figures 4–5)

Description: Shell minute, with 3 cylindrical, slightly impressed body whorls. Sutures distinct, body whorls variable in size. Narrow prosocline axial ribs extending between the sutures on first whorl only. Remaining whorls with ribs near sutures of each whorl (28 on the body whorl of holotype). Shell imperforate, aperture holostomatous and ovate, surrounding lip moderately thickened, inner lip not adnate with parietal area.

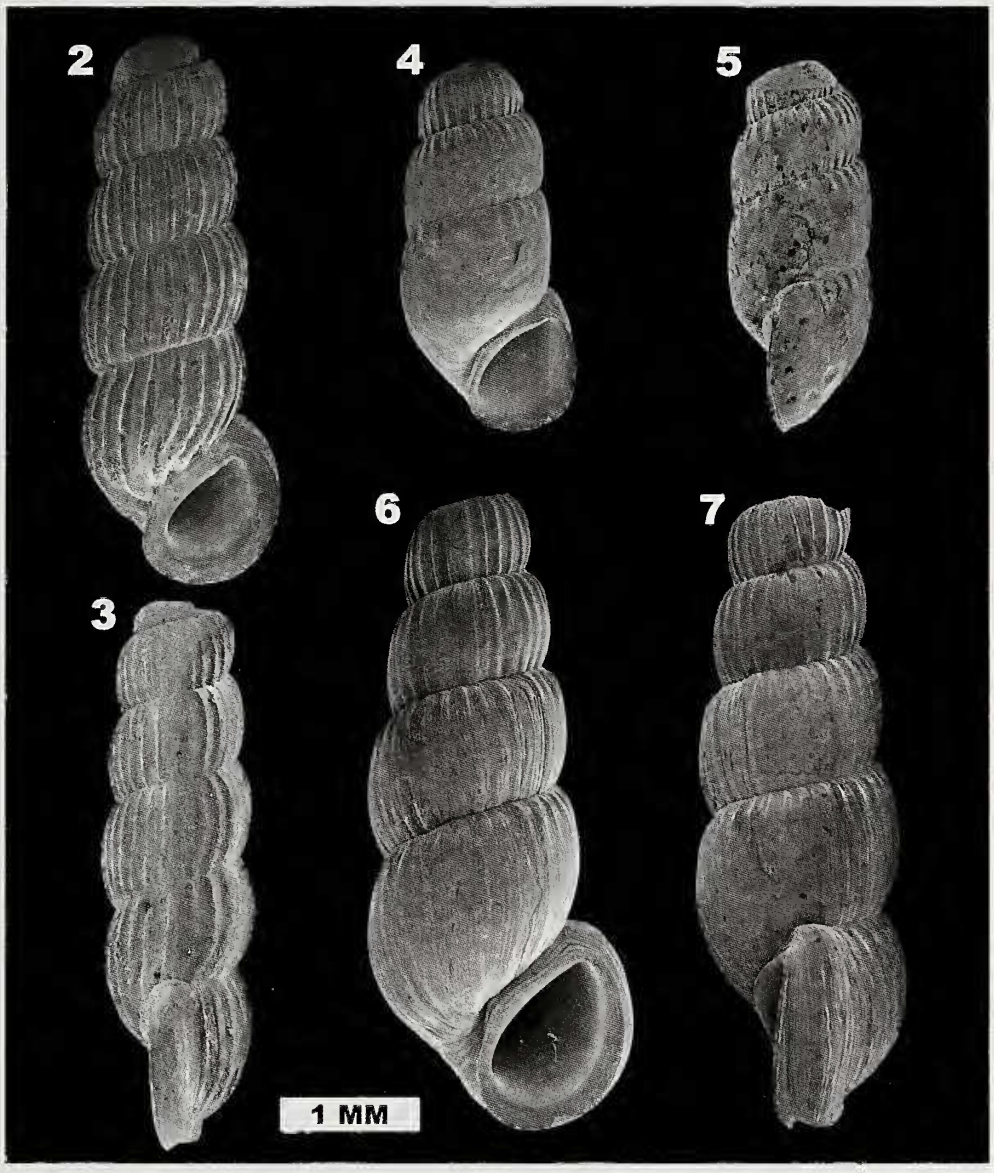
Holotype: UF 71913, maximum height 3.12 mm.

Type Locality: FLMNH IP locality CA018, Chipola Formation, USA, Florida, Calhoun County, west bank of Chipola River (30.4535, –85.163722, datum WGS84).

Distribution: *Truncatella andymurrayi* is known only from the holotype, which also comes from very rich (in abundance and diversity) deposits along the Chipola River. At the Type section, the holotype was derived from the upper bed.

Etymology: Named for Mr. Andy Murray an avid collector of Chipola Formation mollusks.

Remarks: Overall body configuration of *T. andymurrayi* is most similar to *T. caribaeensis*, a *Truncatella* species incorrectly identified and illustrated as *T. pulchella* by Clench and Turner (1948: 156–157, pl. 58, figs. 4–6) and correctly identified as *T. caribaeensis* by De La Torre (1960: 80) and Rosenberg (1989). *Truncatella andymurrayi*, however, is a much smaller species than *T. caribaeensis*, and its whorls are less bulbous. Although both the smooth form of *T. caribaeensis* and *T. andymurrayi*



Figures 2–7. New Florida Neogene *Truncatella* species, in apertural and right lateral views. **2–3.** *Truncatella chipolana* new species, Holotype (UF 71914). **4–5.** *Truncatella andymurrayi*, new species, Holotype (UF 71913). **6–7.** *Truncatella sarasotaensis*, new species, Holotype (UF 71917). Scale bar = 1.0 mm.

possess ribs that do not extend across the whorls, it is possible that some of the ribs are less pronounced on *T. andymurrayi* as a result of abrasion/erosion of the shell, however the strongest sculpture is on the older (apex) of the shell arguing against this supposition.

***Truncatella sarasotaensis* new species**
(Figures 6–7)

Description: Shell minute, tapered body profile with 4 elongate-cylindrical convex whorls. Apical whorls missing in holotype. Suture distinct, deeply impressed. All specimens possess narrow, slightly opisthocline axial ribs (26 on body whorl of holotype) that typically extend across whorls to sutures. Shell imperforate, parietal wall thickened by inner lip, aperture holostomatous, ovate and somewhat flaring.

Type Material: Holotype: UF 71917, maximum height 5.36 mm. Paratypes: UF 71915 (two specimens), UF 71916, maximum height 4.23 mm (one specimen), UF 81225, maximum height 4.36 mm (one specimen) and UF 261371 (13 whole and fragmented specimens), all from type locality.

Type Locality: FLMNH IP locality SO001 (MacAsphalt Shell Pit), Tamiami Formation (upper? Pinecrest beds), USA, Florida, Sarasota County (27.366642, –82.451008, datum WGS84).

Distribution: *Truncatella sarasotaensis* was found by sieving material collected in spoil piles between 1987 and 1990. Although it was not uncommon at FLMNH IP locality SO001, this species has yet to be reported from other, similarly aged, Florida locations.

Etymology: Named for the city of Sarasota where the now water-filled quarry is located.

Remarks: *Truncatella sarasotaensis* is most similar to *T. pulchella*. Like *T. pulchella, T. sarasotaensis* has angular body whorls with numerous evenly spaced axial ribs. However, unlike *T. pulchella*, *T. sarasotaensis* is a larger species, has more bulbous whorls, and much less pronounced ribs, although the latter character may be, in part, a function of abrasion on the fossil specimens.

DISCUSSION

Truncatella chipolana and *T. andymurrayi* represent the oldest New World truncatellids found to date (circa 18 million years old). The California Pleistocene truncatellid reported by Grant and Gale (1931) is currently the only known fossil *Truncatella* from the USA. *Truncatella sarasotaensis* is of comparable age to its California counterpart, and fossils found associated with it are mostly intertidal species.

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